

CLAIMS

What is claimed is:

1. An catheter system, comprising:
a catheter body having an exterior surface and including
an ultrasound transducer having an external side between a
first end and a second end,
a first medium adjacent to the first end of the ultrasound
transducer, and
a second medium adjacent to the external side of the
ultrasound transducer, the second medium being harder than the first
medium.
2. The system of claim 1, wherein the first medium is more flexible
than the second medium.
3. The system of claim 1 wherein a transducer sheath is positioned over
the ultrasound transducer and the second medium occupies a volume
between the transducer sheath and the external surface of the catheter body.
4. The catheter of claim 1 wherein an assembly sheath is positioned
over the ultrasound transducer and the second medium occupies a volume
between the ultrasound transducer and the assembly sheath.
5. The system of claim 1 wherein the catheter body includes a
transducer sheath positioned over the ultrasound transducer and an assembly
sheath positioned over the transducer sheath.

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1 6. The system of claim 5 wherein the second medium occupies a volume
2 between the transducer sheath and the assembly sheath.

1 7. The system of claim 6, wherein the first medium occupies a volume
2 between the assembly sheath and the external surface of the catheter.

1 8. The system of claim 7, wherein a catheter sheath defines at least a
2 portion of the external surface of the catheter body and the first medium
3 occupies a volume between the assembly sheath and the catheter sheath.

1 9. The system of claim 1 wherein a catheter sheath defines at least a
2 portion of the external surface of the catheter body and the second medium
3 occupies a volume between the catheter sheath and the ultrasound
4 transducer.

1 10. The system of claim 1, wherein:
2 the first medium is positioned between the second medium and the
3 external surface of the catheter body.

1 11. The system of claim 1, wherein the catheter body includes a second
2 ultrasound transducer having a side between a first end and a second end.

1 12. The system of claim 1, wherein the second medium is harder than
2 the first medium.

1 13. The system of claim 12, wherein the second medium is at least 3
2 times harder than the first medium.

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1 14. The system of claim 12, wherein the second medium is about 4 to 5
2 times harder than the first medium.

1 15. The system of claim 1, wherein the first medium has a hardness of at
2 least about 10 Shore D.

1 16. The system of claim 1, wherein the first medium has a hardness from
2 about 20 to about 40 Shore D.

1 17. The system of claim 1, wherein the second medium has a hardness
2 of at least 60 Shore D.

1 18. The system of claim 1, wherein the second medium has a hardness
2 from about 80 to about 100 Shore D.

1 19. The system of claim 1, wherein the first medium has a hardness of at
2 least 10 and the second medium has a hardness of at least 60 Shore D.

1 20. The system of claim 1, wherein the first medium has a hardness from
2 about 20 to about 40 Shore D and the second medium has a hardness from
3 about 80 to about 100 Shore D.

1 21. The system of claim 1, wherein the catheter body includes a second
2 ultrasound transducer having a side between a first end and a second end.

1 22. The system of claim 21, wherein the first medium occupies a volume
2 between the ultrasound transducer and the second ultrasound transducer.

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1 23. The system of claim 22, wherein the second medium is positioned
2 between the side of the second ultrasound transducer and the external
3 surface of the catheter body.

1 24. The system of claim 1, wherein the ultrasound transducer is
2 positioned over an elongated body.

1 25. The system of claim 24, wherein the catheter body includes a second
2 elongated body coupled with the elongated body and the first medium
3 occupies a volume between the ultrasound transducer and the second
4 elongated body.

1 26. The system of claim 24, wherein the catheter body includes a
2 terminal body coupled with the elongated body and the first medium
3 occupies a volume between the ultrasound transducer and the terminal body.

1 27. The system of claim 1, a lumen sized to receive a guidewire extends
2 longitudinally through the catheter body.

1 28. A method of fabricating a catheter body, comprising:
2 providing an ultrasound transducer having a side between a first end
3 and a second end;
4 positioning the ultrasound transducer over an elongated body having
5 an external surface;
6 forming a first medium adjacent the first end of the ultrasound
7 transducer; and

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8 forming a second medium adjacent to the side of the ultrasound
9 transducer, the second medium being more transmissive of ultrasound
10 energy than the first medium.

1 29. The method of claim 28, wherein the first medium is more flexible
2 than the second medium.

1 30. The method of claim 28, wherein delivering the second medium
2 includes
3 positioning an assembly sheath over the ultrasound transducer, and
4 delivering the second medium into a volume between the ultrasound
5 transducer and the assembly sheath.

1 31. The method of claim 30, wherein delivering the first medium
2 includes
3 positioning a catheter sheath over the assembly sheath and delivering
4 the first medium into a volume between the assembly sheath and the
5 catheter sheath.

1 32. The method of claim 28, wherein delivering the second medium
2 includes
3 positioning a transducer sheath over the ultrasound transducer,
4 positioning an assembly sheath over the transducer sheath, and
5 delivering the second medium into a volume between the transducer
6 sheath and the external surface of the catheter body.

1 33. The method of claim 28, wherein delivering the second medium
2 includes

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3 positioning a catheter sheath over the ultrasound transducer, and
4 delivering the second medium into a volume between the ultrasound
5 transducer and the catheter sheath.

1 34. The method of claim 28, wherein delivering the first medium
2 includes
3 delivering the first medium into a volume between the external
4 surface of the elongated body and the catheter sheath.

1 35. The method of claim 28, wherein the second medium is harder than
2 the first medium.

1 36. The method of claim 28, wherein the second medium is at least 3
2 times harder than the first medium.

1 37. The method of claim 28, wherein the second medium is about 3 to 5
2 times harder than the first medium.

1 38. The method of claim 28, wherein the first medium has a hardness of
2 at least about 10 Shore D.

1 39. The method of claim 28, wherein the first medium has a hardness of
2 about 20 to 40 Shore D.

1 40. The method of claim 28, wherein the second medium has a hardness
2 of at least 65 shore D.

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1 41. The method of claim 28, wherein the second medium has a hardness
2 from about 65 to about 120 Shore D.

1 42. The method of claim 28, wherein the first medium has a hardness of
2 at least 10 and the second medium has a hardness of at least 65 Shore D.

1 43. The method of claim 28, wherein the first medium has a hardness
2 from about 20 to about 40 Shore D and the second medium has a hardness
3 from about 80 to about 100 Shore D.

1 44. The method of claim 28, further comprising:
2 positioning a second ultrasound transducer over the elongated body,
3 the second ultrasound transducer having a side between a first end and a
4 second end.

1 45. The method of claim 44 wherein forming the first medium includes
2 delivering the first medium into a volume between the ultrasound transducer
3 and the second ultrasound transducer.

1 46. The method of claim 39, further comprising:
2 forming the second medium adjacent to the side of the second
3 ultrasound transducer.

1 47. The method of claim 28, further comprising:
2 coupling the elongated body with a second elongated body.

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1 48. The method of claim 47, wherein coupling the elongated body with a
2 second elongated body includes aligning a lumen within the elongated body
3 with a lumen within the second elongate body.

1 49. The method of claim 47, wherein forming the first medium includes
2 delivering the first medium into a volume between the ultrasound transducer
3 and the second elongated body.

1 50. The method of claim 28, further comprising:
2 coupling the elongated body with a terminal body.

1 51. The method of claim 50, wherein forming the first medium includes
2 delivering the first medium into a volume between the ultrasound transducer
3 and the terminal body.

1 52. The method of claim 50, wherein coupling the elongated body with a
2 terminal body includes aligning a lumen within the elongated body with a
3 lumen within the terminal body.